Space Weather Forecast

Issued on Friday, 02 September 2022 at 01:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares. Minor Geomagnetic Storm expected day 3 (3 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, with no significant flare activity. AR3089 remains the largest and magnetically complex region on the visible disc, with the highest probability of producing significant flares, but appears to be stable despite a recent slight increase in area. There are also two new regions, plus two other numbered sunspot regions on the visible disc: AR3091 in the northwest and AR3092 which rotated onto the southeast limb. These regions are all relatively small, magnetically simple and appear stable. No new Earth bound CMEs have recently been observed on available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were predominantly elevated, roughly between 500 to 580 km/s due to an enhanced solar wind speed from a coronal hole feature. The solar wind peaked at 601 km/s at 01/0553 UTC, but declined later in the day to become slightly elevated around 480 km/s. The strength of the magnetic field was initially moderate, but quickly decreased to become weak, The important north-south component, Bz, was occasionally weakly negative early in the day, but quickly settled to become mainly neutral or positive. Geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels, with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is Low. There is a chance of an isolated Moderate flare from the large region in the southwest and this region also offers a slight chance of a Strong flare. However, a new region may rotate onto the northeast limb within the next couple of days, potentially increasing the probabilities of a significant flare.

Solar Wind / Geomagnetic Activity: Solar winds are expected to continue to gradually decline today (2nd September). Solar wind speed increases are then expected early tomorrow or more likely early day 3 (4th) due to the connection with two consecutive fast solar wind streams. In addition a marked filament eruption observed on 30 August produced a Coronal Mass Ejection which may give a glancing blow at Earth, most likely later tomorrow (3rd September), however confidence is low regarding this.
Geomagnetic activity is expected to be Quiet today, with perhaps an isolated Unsettled interval. Geomagnetic activity is then expected to be Quiet to Unsettled tomorrow, increasing day 3 (4th) to become Unsettled to Minor Storm, with an isolated Moderate storm interval likely, as a result of a substantial enhanced solar wind arriving.

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Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain below the Minor Radiation Storm level (S1). There remains a slight chance of further increases to or above the S1 level, should any significant flares occur from the large region on the visible disc.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	80	40
Strong	G3	No	1	1	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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